

## ENGINEERING

**Shorted Power Lines  
Cleared in Split-Second**

► AN ELECTRONIC "watchman" has been perfected that acts in one-sixtieth of a second to kill power lines when trouble develops.

The device has been successfully tested in the field on a 43-mile span of the Appalachian Electric Power Company's 132,000-volt transmission line linking Roanoke and Lynchburg, Va.

H. C. Barnes of the American Gas and Electric Service Corporation, and L. F. Kennedy of the General Electric Company, told the American Institute of Electrical Engineers meeting in New York that the electronic device maintains its accuracy and speed throughout the life of a vacuum tube, the heart of the "watchman."

Soon to be installed on the American Gas and Electric Company's 330,000-volt system in the Ohio Valley, the electronic relay was hailed as a "significant forward step" in transmission line engineering.

Like electric irons, toasters and frayed lamp cords, transmission lines sometimes become short-circuited. To prevent damage to the line, the land it crosses and the power stations feeding it, engineers "fuse" the line with high speed relays. When trouble develops, these relays trip giant circuit breakers to kill the line.

Some of the fastest-acting relays have required an elapse of several cycles of the 60-cycle current before killing the line. The new electronic relay does the job in less than 0.016 second.

Science News Letter, January 30, 1954

## GENERAL SCIENCE

**President's Budget Asks  
Two Billion for Research**

► PRESIDENT EISENHOWER has recommended in his budget message to Congress that the government spend \$2,014,200,000 on scientific research and development during the fiscal year 1955, which begins July 1, 1954. This is a drop of \$113,000,000 from the amount estimated to be spent in fiscal year 1954, ending June 30. For the first time the budget included a special section on "Research and Development."

A heavy crackdown on construction of research facilities is responsible for most of the recommended cuts, with the military taking the biggest loss in this and in the funds to conduct research. Even so, two-thirds of the government's research and development moneys, or a total of \$1,350,000,000 will be spent by the Department of Defense.

Another 13% of the proposed two billion dollars budgeted for research and development goes to the Atomic Energy Commission, which with the Navy, has not only launched the first atomic submarine, the U.S.S. Nautilus, but also announced plans for launching during the coming fiscal

year a second atomic submarine of different design, the U.S.S. Seawolf. President Eisenhower proposed that the AEC spend \$261,300,000 on research and development in fiscal 1955, a drop of more than ten million dollars from 1954.

One of the largest increases recommended for any scientific agency of the government during fiscal 1955 went to the National Bureau of Standards, budgeted for a total of \$8,115,000 compared to \$6,440,000 in 1954. Of this, a little over one million is for an increase in research and testing facilities. The proposed increase is in line with recommendations made last fall by a committee of scientists headed by Dr. Merwin J. Kelly of Bell Telephone Laboratories that previous fund cuts be restored and augmented. (See SNL, Oct. 24, 1953, p. 262.)

Only new entry for 1955 in the research and development field for the government is the President's Advisory Committee on Weather Control, given \$100,000 for its first full year of operation. The committee, after studying whether cloud seeding efforts have been successful in making rain, will make recommendations on what weather control laws, if any, should be enacted by Congress. Total appropriations for the Weather Bureau were cut from \$27,000,000 during fiscal 1954 to \$24,750,000.

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## ENGINEERING

**Build Two Powerhouses  
To Feed AEC's New Plant**

► TWO NEW power plants now are under construction in Ohio to supply the Atomic Energy Commission's new gaseous diffusion plant with 15 billion kilowatt hours per year.

Termed the largest single power contract in the 74-year history of the electric utility industry, the project is to be completed by June 1, 1956, although the first generator will "go on the line" by Jan. 1, 1955.

The project, costing an estimated \$400,000,000, is being financed by insurance companies, banks, stocks and other private sources, Philip Sporn and Vernon M. Marquis of the American Gas and Electric Service Corporation told the American Institute of Electrical Engineers meeting in New York.

More than a score of utilities are cooperating in the project. Two new companies, the Ohio Valley Electric Corporation, and its subsidiary, the Indiana-Kentucky Electric Corporation were formed as an initial move in implementing the project.

To be built near Madison, Ind., and Gallipolis, Ohio, the two powerhouses will be 142 and 50 miles, respectively, from the AEC's diffusion plant. The plants will be linked to the AEC installation by 400 miles of 330,000-volt transmission lines, and will consume 7,500,000 tons of coal yearly. The coal will come from the western Kentucky-southern Indiana fields and the Ohio Appalachian fields.

Science News Letter, January 30, 1954



## PUBLIC HEALTH

**Individual Protected  
In New Health Plan**

► SOME THINGS voluntary health insurance plans may provide in the future if President Eisenhower's "health protection" program is carried out are these:

1. Individuals as well as groups will be able to enroll, which is not now possible in all cases.

2. Costs of diagnostic tests and of preventive services, such as vaccinations, may be included in all plans.

3. Old people and those with chronic diseases may be able to enroll in the health insurance plans. Most now have to refuse these groups in order to keep costs down.

4. Doctors' visits to the patient in his home, nurses in the home, and rehabilitation teams in the home may be included.

These ways of extending benefits of private voluntary health insurance programs were given just prior to the President's message to Congress in a speech by a high-ranking government official, Dr. Chester Scott Keefer, special assistant on health and medical affairs to the Secretary of Health, Education and Welfare.

"Expansion and improvement of private voluntary health insurance," he said then, "will go a long way toward reducing the future problems of meeting the costs of medical care for all groups in the population."

He cited the analogy in old-age and survivors insurance, pointing out that when that program started, public assistance had to carry the major load of income maintenance for the needy aged, the widowed and the orphaned. As the insurance program expanded and was improved, public assistance rolls began to decline.

Science News Letter, January 30, 1954

## ENGINEERING

**TVA Remote Control Plan  
To Save \$500,000 Yearly**

► A TENNESSEE Valley Authority plan that calls for remote control of five hydro plants and 23 substations has been worked out to cut down expenses.

R. M. Alspaugh and A. P. Maness, both of TVA, told the American Institute of Electrical Engineers meeting in New York that remote control of these installations, plus a personnel reduction at 10 other hydro plants is expected to save \$500,000 a year.

The present schedule for installing the remote control and supervisory equipment runs through 1955. The engineers reported that other studies are under way that may lead to an extension of the project.

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# CE FIELDS

## ASTRONOMY

### Lunar Eclipse Total Despite Slim White Arc

► AMATEUR MOON gazers may have thought the Jan. 18 eclipse was not total because a thin sliver of white showed at one edge throughout the total part of the lunar show. Actually, the eclipse was total, the only lunar eclipse scheduled for 1954.

Where weather permitted clear seeing, most of the moon was its usual ruddy eclipse color. Reason for the thin streak of light at one edge, astronomers in Washington explained, was that instead of passing right through the middle of the earth's deep shadow, or umbra, the moon skirted near its edge although totally inside it.

High in the earth's atmosphere a huge, very clear area, such as might be found over the Pacific, bent enough of the sun's light to give the moon's edge a thin line of white, even though the moon was completely in the earth's shadow.

Since such an arc depends on atmospheric conditions at the time of the eclipse, its occurrence cannot be predicted. Although the line appeared white, it seemed so because of contrast with the coppery moon, and was considerably darker than direct sunlight on the moon's surface since the sunlight had passed through the earth's atmosphere.

Science News Letter, January 30, 1954

## METEOROLOGY

### Cold Weather Results From "Blocking" Effect

► THE PRESENT unusual weather on the East Coast will continue until mid-February, long-range forecasters at the U. S. Weather Bureau predict.

Resulting from a "blocking" effect that pulls the normal storm tracks of polar air farther southward, the "frequent snows" forecast for from Virginia northward on the eastern seaboard during the mid-January to mid-February period will be the first such severe weather in six years.

This same effect will result in temperatures below seasonal normals over most of the nation, the weathermen predict. Only the Southwest and the Gulf Coast, where temperatures are expected to average above normal, will escape the chilly temperatures. The greatest "unseasonable" coldness is expected over the Great Lakes region and the Ohio Valley.

Precipitation, which can be rain, snow or sleet at this time of year, is expected to exceed normal in the Gulf states and from the Appalachians eastward, including frequent snow from Virginia northward.

Greater than normal precipitation is also predicted for the central and southern portions of the West Coast states and in the northern Rocky Mountain states, but sub-normal amounts are indicated over the Great Lakes and upper Mississippi Valley. In areas not specified, about normal precipitation is forecast for the period until mid-February.

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## TECHNOLOGY

### Tungsten May Replace Platinum in Thermometer

► TUNGSTEN MAY replace platinum in electric thermometers used in industry to measure high heats.

F. R. Sias, J. R. Macintyre and A. Hensen Jr., General Electric company engineers, told the American Institute of Electrical Engineers meeting in New York that tungsten not only has an extremely high melting point, but also is readily available in the form of high purity ductile wire drawn for light bulb filaments.

The three engineers reported that such a thermometer had been built and, to their knowledge, is the "first successful one with stabilities as good as, or better than, platinum."

Since platinum's upper heat-measuring limit is about 1,080 degrees Fahrenheit and tungsten's is around 1,800 degrees Fahrenheit, the new type of resistance thermometer will be able to check heats greater than those that can be measured at present by ordinary resistance thermometers.

Resistance thermometers use a heat-sensing element containing some material that changes its electrical resistance as it gets hotter or colder. Both platinum and tungsten have this property.

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## SEISMOLOGY

### When Quakes Arrive, They Punch Time Clock

► EARTHQUAKES PUNCH the time clock at the John Carroll University seismograph in Cleveland and scientists have visual notification that the uneasy earth has shaken itself.

Modern earthquake recording machines do not produce an easily visual record, since the waves are traced on photographic paper that must be developed. For prompt notification, a photoelectric earthquake indicator, christened the seismolog, was devised by Harry C. Nash and Edward F. Carome.

When a quake occurs, an extra mirror on the seismograph throws light on a photocell. This operates a relay circuit that causes a recorder to print the time of the impulse like a time clock.

When the earthquake has announced itself in this way, the seismologists can then develop and read the seismograms in order to determine its location and intensity.

Science News Letter, January 30, 1954

## ICHTHYOLOGY

### Fish in Hibernation During Arctic Winter

► FISH HIBERNATE under ice five feet thick on fresh water lakes during the Arctic winter, just as bears sleep for months, Daniel M. Cohen and Prof. Donald Wohlschlag of Stanford University reported to the Western Society of Naturalists meeting at the University of Southern California in Los Angeles.

These whitefish, similar to those found in the Great Lakes and in the high Sierra country of California, live on fat that they store up during the short summer season of four or five weeks in northern Alaska, at which time they eat continually and do all their growing.

"The fish we caught in nets near the ice were fat," Mr. Cohen said. "They had little if any food to eat under the ice during the winter, didn't have much room to move around, were subjected to severe cold, and apparently didn't grow at all during this period. They were apparently in a state of hibernation."

Science News Letter, January 30, 1954

## MILITARY TACTICS

### Atom Sub Maneuvers At "Joy Stick" Command

► THE NAVY'S first atom-powered submarine will be guided with a "joy stick" when it sails the seas at unheard-of speeds for underwater craft.

The joy stick closely resembles the sort of control that an airplane pilot uses to fly his machine. It permits one man to control both the bow and stern when the submarine dives. The same man can also steer.

Previously three men were required to do this elementary work.

Another innovation of the Nautilus is its electronic system to keep tabs on bearing temperatures. The Bogue Electric Manufacturing Company, which supplied the joy stick control and the bearing-temperature monitor, reports that the bearing indicator system is the "most sensitive ever designed."

It uses a series of magnetic amplifiers rather than vacuum tube amplifiers to keep continuous track of 120 critical bearings. When the temperature of a bearing exceeds a definite temperature range, a red light flashes on a control panel. This tells an operator that a bearing is overheating.

Both the bearing temperature system and the joy stick control system are designed to fail safely should something go wrong. If anything happens to any of the parts in the bearing system, a red light for that section flickers on as a warning.

Provisions are made in the joy stick controls to prevent any improper movement of the diving planes should something go wrong with the controls. Even if something happens to the joy stick system, the diving plane and rudder can be operated by hand, thus enabling the submarine to remain in action while being repaired.

Science News Letter, January 30, 1954